



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/786,125	02/26/2004	Cynthia W. Berry	1215-0506P (000550-078)	1857
2292 7590 01/30/2007 BIRCH STEWART KOLASCH & BIRCH PO BOX 747 FALLS CHURCH, VA 22040-0747			EXAMINER GEBREMARIAM, SAMUEL A	
			ART UNIT	PAPER NUMBER
			2811	
SHORTENED STATUTORY PERIOD OF RESPONSE		NOTIFICATION DATE	DELIVERY MODE	
3 MONTHS		01/30/2007	ELECTRONIC	

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Notice of this Office communication was sent electronically on the above-indicated "Notification Date" and has a shortened statutory period for reply of 3 MONTHS from 01/30/2007.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

mailroom@bskb.com

Office Action Summary

Application No.

10/786,125

Applicant(s)

BERRY ET AL.

Examiner

Samuel A. Gebremariam

Art Unit

2811

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 31 October 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 9-15 is/are pending in the application.
- 4a) Of the above claim(s) 10-13 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 9, 14 and 15 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 10-13 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The scope of claims 10-13 is unclear because the claims depend on cancelled independent claim 1. Therefore claims 10-13 are withdrawn from consideration.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Glenn et al., US patent No. 6,528,875 in view of Uchikoba US patent No. 6,698,084.

Regarding claim 9, Glenn teaches (fig. 1a): a co-fired (stacked ceramic is fired together) multilayer laminate ceramic (fig. 1a and col. lines, 35-37); plurality of stacked co-fired (fired together) layers of a predetermined type of ceramic material (30,32,34) including metallization (19, 21, where vias 21 are filled with conductors) in predetermined patterns on and through the layers (30 and 32); a plurality of exposed electrical conductors (layer 19 that is exposed and connected to 20) including leads (18)

at a predetermined locations on the plurality of stacked layers (30,32,34); the conductors being comprised of a metal paste/layer including one or more additives to promote adhesion to the layers of ceramic material (conductor 19 is formed of gold-nickel alloy, gold-nickel alloys adheres well on ceramic); a bonding metal layer (20) located on top of the exposed electrical conductors (19) at the locations of the leads (18) and bonded to the bonding metal layer (20) at the predetermined locations.

Glenn does not explicitly teach that the bonding metal layer being of the same metal as the conductors, however devoid of the one or more additives.

Uchikoba teaches (figs. 1A-1C) forming a conductive electrode (43) that is formed of gold and nickel and connected a gold bump (31, no nickel) in the structure of forming a semiconductor device package.

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the gold-nickel to gold connection taught by Uchikoba in the structure of Glenn in order enhance the reliability of the bonding during operation. Therefore the combined structure of Glenn and Uchikoba teaches the bonding metal layer being of the same metal as the conductors (gold), however devoid of the one or more additives (nickel is taken to be the additive) and the leads are bonded to the bonding metal layer at the predetermined locations.

5. Claims 14 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Glenn in view of Uchikoba and in further view of Auerswald US patent No. 6,698,084.

Regarding claim 14, Glenn teaches (fig. 1a) a co-fired multi-layer laminate structure comprising (10): a plurality of stacked co-fired layers (30,32,34) of a predetermined type of ceramic material (stacked ceramic fired together) including metallization (19,21, where vias 21 are filled with conductors) in predetermined patterns on and through the layers (30,32,34); a plurality of exposed electrical conductors (layer 19 that is exposed and connected to 20) including leads (18) located at predetermined locations on the plurality of stacked layers; the conductors being comprised of a metal paste/layer including one or more additives to promote adhesion to the layers of ceramic material (conductor 19 is formed of gold-nickel alloy, gold-nickel alloys adheres well on ceramic); a bonding metal layer (20) located on top of the exposed electrical conductors (19) at the locations of the leads (18) and being of the same metal as the conductors (19); wherein the leads are bonded to the bonding metal layer (20) at the predetermined locations; the conductors are comprised of a gold paste/layer.

Glenn does not teach that the bonding metal layer is the same metal as the conductor however devoid of the one or more additives so as to enhance bond ability of the leads thereon, wherein the additives is selected from a group of materials including copper, bismuth and glass and the bonding metal layer is comprised of a pure gold paste devoid of the additives.

Uchikoba teaches (figs. 1A-1C) forming a conductive electrode (43) that is formed of gold and nickel and connected a gold bump (31, no nickel) in the structure of forming a semiconductor device package.

Auerswald teaches the use of additives such bismuth in particular paste made of gold in a structure of forming automatic-machine-bondable ceramic-circuit carrier (col. 2, lines 54-61 an col. 3, lines 5-12).

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the gold-nickel to gold connection taught by Uchikoba in the structure of Glenn in order enhance the reliability of the bonding during operation. Therefore the combined structure of Glenn and Uchikoba teaches the bonding metal layer being of the same metal as the conductors (gold), however devoid of the one or more additives (nickel is taken to be the additive) and the leads are bonded to the bonding metal layer at the predetermined locations.

Furthermore it would have been obvious to one of ordinary skill in the art at the time the invention was made to use additive such as bismuth in gold paste in the combined structure of Glenn and Uchikoba as taught by Auerswald in order to form an automatic-machine-bondable ceramic circuit carrier.

The limitation of the bonding metal layer is applied to the conductors prior to a co-firing of said stacked layers of ceramic material and then co-fired along with said layers of ceramic material or the bonding metal layer is applied to the conductors and post fired after an initial co-firing of said layers of ceramic material is not considered because it is a product-by-process claim. "[E]ven though product-by process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious

Art Unit: 2811

from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process." *In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985).

Response to Arguments

6. Applicant's arguments filed on 10/31/2006 have been fully considered but they are not persuasive. Applicant argues that the multilayer laminate ceramic structure wherein the conductors are comprised of a metal paste including one or more additives. As stated in the rejection Glen in view Uchikoba teaches the claimed subject matter. The arguments with respect to claims 11-13 is moot because the claims are withdrawn from consideration because they depend on cancelled independent claim 1.

Conclusion

7. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Samuel A. Gebremariam whose telephone number is (571)-272-1653. The examiner can normally be reached on 8:00am-4:30pm.

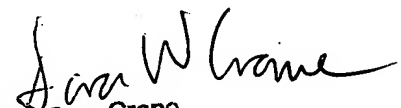
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richard Elms can be reached on (571) 272-1869. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2811

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

SAG

January 20, 2007


Sara Crane
Primary Examiner